Paper/Work
LLNL Postdoc Association Newsletter
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Interview: Dr. Tomás Díaz de la Rubia, LLNL Deputy Director of Science & Technology

Dr. Tomás Díaz de la Rubia is the LLNL Deputy Director of Science & Technology. He is responsible for all Lab research and development in science, technology, and engineering. Tomás also guides the long-range planning for the Lab's R&D efforts, and he is the lead author of the Lab's five-year strategic roadmap.

Tomás met with the Postdoc Association for the fascinating and informative discussion that we present here. The following interview was conducted on April 3, 2012 by Adam Sorini and David Martinez. Photos by Christine Zachow and additional editing by Nathan Kugland.

Adam Sorini: Could you tell us when and why you came to the Lab?

Tomás Díaz de la Rubia: I came to the Lab as a postdoc in 1989. I was contemplating multiple offers from academia, industry, and national labs. At the end of the day there were two deciding factors in my coming to Livermore: 1) the guy I wanted to work with, a very good material scientist named Mike Guinan, was here; 2) the big computers were here. At the time the big computers were Crays. The combination of those two factors made Livermore very attractive. In terms of the people and the computers, IBM couldn't beat it, Cornell couldn't beat it; there was no other choice.

David Martinez: When you came to the Lab as a postdoc, what was the first project that you worked on?

Tomás: I was hired essentially to develop a new code to do molecular dynamics and kinetic Monte Carlo in fusion materials. It was a big international project. The idea was that we were going to develop this code and then make it available to the international community through an agreement under the International Energy Agency, and we did that. It was great. It was a blast.

Adam: Was that a parallel code?

Tomás: It started as a vector code on the Crays and quickly evolved into a parallel code when we got some of the first parallel machines here: Thinking Machines, Cray T3D, and such.

Adam: Is your code still in use?

Tomás: It is still in use, I think. I don't use it. It was a big

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code and ended up being widely used in Japan, in Europe, and here in the States.

Adam: How did you move from computation into management?

Tomás: It took quite a number of years. I was a foreign national at the time. All kinds of things kept me away from management as a foreign national. I didn't have a clearance for the first seven or eight years at the Lab. Then I became a US citizen and things started to change. I became group leader for computational materials science. From there one thing leads to another and you start getting more and more into management. The transition was essentially just taking over the group and actually building the group.

Adam: Once you become group leader they sort of suck you in?

Tomás: Yeah, then it started. You know: "Hey, why don't you become the deputy division leader for this or that." At the time, what gave you the most opportunities to get into leadership positions was your record of scientific and technical accomplishments. As a foreign national, I had no opportunity to make programmatic contributions directly to the weapons program or things like that. So, my whole career was built on strong scientific credentials. That was the metric: papers, invited talks, all of that stuff. And it was clearly understood, at the time, that if you wanted to be in a leadership role at the Laboratory you had to have very strong scientific credentials. Now, there are some different requirements. At the time, we didn't have to worry as much about business development or developing new sponsors or new contacts with industry. Things were more stable so you didn't have to worry about those other skills, or going out and building programs. There's a different skill set that is required for management now that goes beyond pure technical, academic or scientific credentials.

David: Could you describe the strategic plan for Science and Technology (S&T) at Livermore?

Tomás: I will. Let me finish the story on this. What happened was: In 2002 I'd been at the Lab 12 or 13 years, and I was selected to be associate director for Chemistry and Materials Science. If I look back at it now, I was probably not ready to be in the job at the time. But the Lab was taking risks and selecting people, without perhaps all the experience you would want, based on technical credibility and other things. There was a certain amount of risk taking in leadership and management, which I think is important to maintain in the future, so that people will aspire to leadership positions at the Lab and have it be seen as something positive. I was very lucky to have that opportunity.

With respect to the strategic plan, back in 2007 we had the transition from the UC management of the Lab to the new contract. I made a proposal to George Miller and the senior management team that we needed to create a strategic roadmap that laid out the directions that were important to the Laboratory; where we needed to make investments to meet critical national needs 5 or 10 years down the road; where we needed to make investments in science and engineering so that we could position the Laboratory to be able to meet future national needs. That was the basis for creating a strategic

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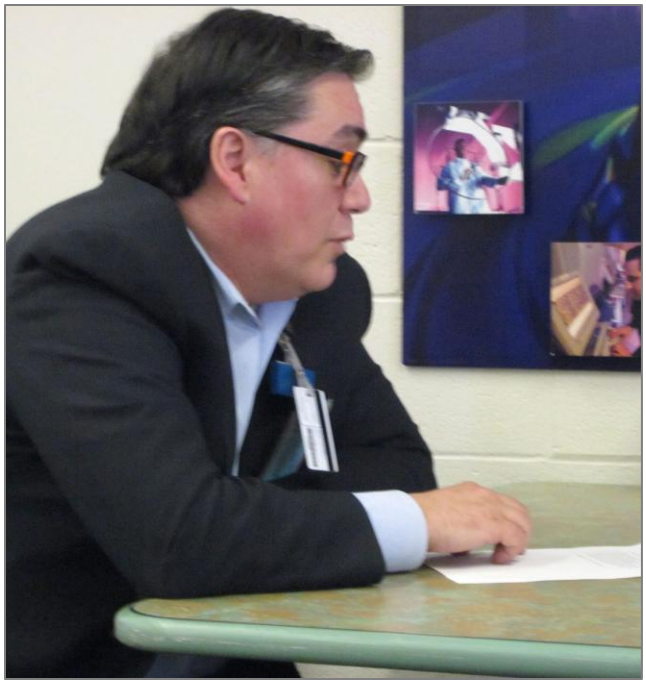
roadmap. So we consulted with lots of people in the Lab, in the government, in different sectors, and we very carefully looked at the critical national security needs to define a set of strategic focus areas for the Lab. Along with that we built a plan for the scientific pillars of the Lab, because without having a strong basis in science and technology, you end up building sandcastles. So, the strategic plan is a way to decide how to make investments over a sustained period of time that lead to accomplishing a set of goals to enhance our national security.

Adam: Could you talk about how S&T was affected when the NNSA came on the scene in 2001?
Tomás: I think at the time there wasn't a particular impact of the NNSA being created. The important thing that happened was the creation of the Stockpile Stewardship Program in the mid '90s. That was the thing that changed the dynamic of where the Lab was going, and where the whole US nuclear security complex was going. There was bi-partisan agreement that, in the absence of underground nuclear testing, we needed a strong science-based program to sustain and certify the stockpile for the long term. That's what set into motion everything that we're doing now. When NNSA came along, that was a bureaucratic reform more than anything else. It didn't have a big impact on the science at that time. As for now… you can judge for yourselves. You saw the National Academy of Sciences report on the management of S&T at NNSA laboratories. They were very critical of the NNSA micromanagement, in that report. They made some strong recommendations. There were hearings in Congress about this. I think what happened over time was that the relationship between the NNSA and the Laboratory changed such that it's not necessarily conducive to the most creative scientific process, because there's too much transactional oversight.



Adam: Yes, that was an interesting report.
Tomás: It was very interesting.

Adam: When would changes occur if they were to occur?
Tomás: These things are difficult, right? There have been several reports along these lines. The Perry-Schlesinger commission [http://www.usip.org/strategic_posture/final.html] wrote a report on very similar issues about 2 or 3 years before the National Academy report came out. There was also a report by the Stimson Center [http://www.stimson.org/images/uploads/research-pdfs/Leveraging_Science_for_Security_FINAL.pdf] that was very similar. They all had the same criticism, and this has been going on now for a number of years. So, now you might think that the National Academy of Sciences report is the straw that broke the camel's back, and something is going to happen. You have hope that something is going to happen, but I don't know the timeframe. Congress has been talking to lab directors, former lab directors, chairs of the National Academy, and there are calls for reform in Congress, but it is difficult to reform bureaucracy.

Adam: Have you seen the "big data" research initiative that just came out as a 200 million dollar initiative through the White House? Do you have thoughts on it and is LLNL involved?
Tomás: I don't have a lot of detailed thoughts on it. Big data is now the boss. It's all about what we're going to do with the massive amounts of data. This is also an important problem in physics and astrophysics. We're always thinking about computing in terms of solving differential equations, but now it's a whole different world. So it's very good that they're putting a focus on this from the administration point of view. Parney [Albright] is the Lab's number one advocate of working on big data, because it's important to some of our national security missions. So I think you're going to see

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more and more of this sort of thing happening. It's an interesting opportunity and I think it's going to be something to watch.

David: Going back to the strategic plan, how do postdocs fit into the Lab's road map to the future?
Tomás: It's a critical component and one of the things we recognized back in 2008. You may have seen the columns that I've had in NewsLine about this. As a result of the transition [from UC to LLNS management] the number of postdocs at the Lab was at an all time low—at least as far as anybody can remember—and that was very disturbing because the postdoc program is a pipeline to the future of the Laboratory. I think of it very differently than an academic environment or perhaps even an industrial environment, such as Bell Labs or IBM, where one would be a postdoc for two years and then they were out and there was no expectation of continued employment. At the Lab we've always looked at it very differently. The idea is that you have a strong filter up front and then once you come into the Lab we find ways to keep perhaps 50-60% of the postdocs for the long term. We went from 110 to 220 postdocs in about 2 years to rebuild the postdoc pipeline. So from that point of view, there was a strong correlation between the investments made in the roadmap and the growth and rebuilding of the postdoc program. There was also a fair amount of input from early career employees and postdocs that were tasked with being almost a "red team" who were very involved in the creation of the road map.

Adam: So, The postdoc numbers are up now again?
Tomás: The post doc numbers are up above 200 still. When I came to the Lab it was probably about 60 or 70. The historical number for a long time was around 140, but we were losing people left and right. It was a difficult time, the transition, we had layoffs, money was tight, but now we are back up to over 200 postdocs. The other thing we tried to do very early on was to create a program that had a strong emphasis on mentors. When I came to the Lab there was no postdoc program; you fended for yourself. If you were lucky, someone would pay attention to you. That changed in the mid 90's and it has been evolving over time. There is now a more central community. For example, the things you guys are doing with the newsletter are just terrific. The postdoc population is extremely important to the future.

Adam: For a postdoc to become a staff scientist, does that mean that a current staff scientist has to retire?
Tomás: No. There is always some growth in different parts of the Laboratory and there is a steady influx of people from the postdoc branch to the Lab at a rate of 50%. What happens typically is that you get 50% of the Postdocs to stay. We want them to stay. *"Here is an offer, here is a position, and we want you to continue."* As for the other 50%, about half of those want to leave and the other half… Well, see you later. Generally, where there is a general agreement between their supervisor and the Laboratory and the postdoc, if you want to stay then there is an opportunity to stay. Do you guys have a good idea of what you need to do to get a job at the Lab?

Adam: Well you certainly have to do your job well.
Tomás: Right, go to conferences, publish, do your job well.

Adam: Get money or an LDRD? Is that also important?
Tomás: I am a little skeptical about that. I had to get an LDRD my second year as a postdoc because the guy I was working with decided he was [leaving the Lab and] going to Washington. I was fortunate enough to get an LDRD and at the time it was hard because there was no postdoc program.

Adam: Lab wide?
Tomás: No, it was in my directorate. And then I got a call from the head of the LDRD program basically asking, "*Who the hell are you and what are you doing*". So I showed him what I was doing and then it was fine. I think it is a good thing to do an LDRD because it helps you learn to write proposals and learn to be a PI. But, I don't see it as a requirement for a postdoc. I think it is more about, as you said, doing your job well. Connecting with people who are going to care about keeping you at the Lab.

Adam: What about publishing?
Tomás: When I came to the Lab I asked my supervisor Mike what my job was. He said, "*Just become famous*." He said, "*These three years here as a postdoc are a unique time. What you have got to do is publish as much as you can, go to conferences, and use the time to be a scientist.*" It really is a time to do research.

David: What do you think is a good publication record per year? One or two publications per year?
Tomás: It really depends on the field you are in. I don't think the specific number matters, and it changes over your career a lot. When you are working by yourself as a

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postdoc, a couple of papers in a year is pretty good because it was you doing the stuff. Then as you get further along, you have a group, you have collaborators, and everyone is writing papers. It becomes more like a factory where you are pushing out 10-15 papers a year. At this stage in your career I don't know what the number is but it is whatever feels good to you where you feel like you are making progress.

David: Are you referring specifically to first author publications?

Tomás: No, not specifically. There is nothing wrong with collaborations and there is nothing wrong with participating in ongoing research studies. I don't think there is a magic formula. I do encourage you to seek out ideas where you can be the first author. It helps you establish yourself.

Adam: We also want to ask you about the collaborations with Spain…

Tomas: Those are fun. I have a lot of colleagues over there at the polytechnic university and there is a group that does inertial confinement fusion research. Actually, I first met them when I was a postdoc at the Lab. I got a phone call one day from somebody in NIF where they said, "Hey, we have these visitors from Spain and they read a paper of yours and want to meet you." I said "Sure." And now we have been friends for many years.

Thank you, Dr. Díaz de la Rubia.

Job Resources

Official LLNL jobs site: careers.llnl.gov

Postdoc listings: www.postdocjobs.com
Hundreds of listings for postdocs, research associates, and other jobs that require a doctoral degree.

Academic Keys: www.academickeys.com
Jobs such as professor & university research scientist.

Psi-K Network: www.psi-k.org
Electronic structure theory news, events, jobs.

APS Careers in Physics: www.aps.org/careers
Institute of Physics: brightrecruits.com
Gateways to physics jobs and careers.

Career article of the month:
Science PhD Career Preferences: Levels, Changes, and Advisor Encouragement. PLoS ONE 7(5).

Nature: Career guidance with an international focus.

Science and AAAS: sciencecareers.sciencemag.org

Government jobs: http://www.usajobs.gov/

Industry jobs: www.monster.com
http://sfbay.craigslist.org/jjj/
www.linkedin.com/jobs

Upcoming career development events:
Postdoc poster symposium: June 14

Upcoming General Events

Lightning Talks! (every third Friday of the month)
Friday, May 18th, from 12:00 - 1:00 PM
B543, Grand Canyon Room. Open to all!
- Mark Rosin, "Guerilla Science"
- Charles Reid, "The US Energy Portfolio"
- plus others!

Physics & Life Sciences Postdoc Research Seminar
Tuesday, May 22, 11 AM
B151 R1209 (Stevenson Room). Refreshments served.
- Andrii Chyzh (Physics)
- Michael Buchoff (Physics)

Stay up-to-date with the Postdoc email list:
https://ebb.llnl.gov/postdoc/email_list.lasso

Next Steps: Interviews with Former Postdocs

Interview conducted by David Alessi.

When was the end of your postdoc?

Sonia Wharton: January 2011.

Where do you work now and how is that similar or different from what you did as a postdoc?

I work in the Energy Group in the Atmospheric, Earth and Energy Division of PLS. Half of my current work is similar to the projects that I worked on as a postdoc, which involve wind energy related research. We are looking at forecasting wind power and understanding how power generation is related to different atmospheric conditions. The other half of my work is funded through an LDRD award that I applied for, and this project is more similar to the kind of research that I did as a Ph.D. student. We are examining carbon dioxide fluxes in different ecosystems along the West Coast and gathering observations of the planetary boundary layer to better understand flux transport mechanisms. This project is also testing out a land surface-atmosphere model called ACASA, and the LDRD funding enabled me to hire a new postdoc, Jessica Osuna.

Did you apply elsewhere? Why did you make this particular choice (Lab vs. academia vs. industry)?

I did not apply elsewhere. I enjoy working at LLNL and enjoy the diversity of my projects and the people around me. I would not have considered industry but might have considered academia if a position opened up at a nearby university that seemed like a good opportunity. But in all honesty, I didn't look into jobs elsewhere because I was certain that I wanted to stay at the lab and the opportunity to do so was here.

What did you enjoy the most and the least about being a postdoc at LLNL? What do you think are the differences between a postdoc at the Lab versus at a university?

I enjoyed being able to finish up my Ph.D. papers with the 25% postdoc account. I think this is a huge advantage for being postdoc at LLNL because there is time, money and support from upper management and mentors to finish Ph.D. related papers. I enjoyed being able to focus on one or two projects which led to a couple of publications as a post-doc. As research staff, I am pulled in more directions because now I am a PI and have more projects to work on. I enjoy the diversity of my work now, but as a post-doc it is nice to be able to concentrate on one project and write those papers. There isn't anything that I strongly disliked as a postdoc. The only thing is that initially I did not do any fieldwork in the first year of my postdoc and I really missed that

component of my research. But I started on a project during my second year that led to fieldwork and future research endeavors. I do not know of any first hand differences between being a postdoc at the Lab versus at a university. I can guess that you'd have more time to finish Ph.D. work at the Lab because of the 25% postdoc account and because it is strongly encouraged here that you spend time to write those papers up. Also, the postdoc salary at LLNL is much higher than at most universities.

How far along your postdoc were you when you decided what the next step in your career would be?

I was likely one year into my postdoc when I decided that I'd really enjoy working at the Lab and that would be the best career decision for me.

How did you get your new job?

I think I was hired as a staff researcher because I was able to show the Lab that my research is critical to the Lab's strategic investments. I also had a number of

Next Steps: Interviews with Former Postdocs, continued

publications, something that is critical to being converted. And just as important, I had made it known to upper management and other staff that I wanted to stay at the Lab. As a postdoc I also made an effort to meet new people around the Lab and learn about their projects, especially the ones that were related to my research.

Any piece of advice for postdocs at LLNL?

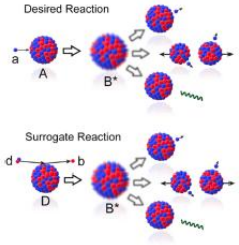
Take advantage of the 25% postdoc account! Finish your Ph.D. papers, go to conferences, expand your skill set, take training classes… all of these things will help you whether you want to stay at the Lab or take a position elsewhere. Also, reach out to find mentors. You can have more than one mentor. It's great to have someone who helps you academically but also it's great to have someone who can help you navigate the Lab.

Postdoc-Related Highlights from Notes to the Director

Precision Technologies for Nuclear Photonics Gamma-ray Sources

Tunable, high-precision gamma-ray sources may be used to detect specific nuclei and isotopes through a process called nuclear resonance fluorescence. Mono-energetic gamma-ray (MEGa-ray) technology has the potential to advance the study of the nucleus and to create new applications in such areas as the detection of special nuclear materials. In an invited article in the May issue of Physics of Plasmas, LLNL researchers described the laser and accelerator technologies necessary to develop high-precision gamma-ray sources for nuclear resonance fluorescence applications and other nuclear photonics investigations. The researchers said high-gradient X-band technology, used in conjunction with fiber-based photocathode drive laser and diode-pumped solid-state interaction laser technologies, offer optimal performance for high gamma-ray spectral flux, narrow bandwidth applications. Lead author **Félicie Albert** (former postdoc) was joined on the paper by Fred Hartemann, Scott Anderson, Rick Cross, David Gibson, James Hall, Roark Marsh, Mike Messerly, **Sheldon Wu** (former postdoc), and Craig Siders, and NIF & PS Chief Technology Officer Chris Barty.
http://link.aip.org/link/doi/10.1063/1.3695021

Surrogate nuclear reactions approach in Reviews of Modern Physics



Nuclear reaction cross sections are important for a variety of applications in the areas of astrophysics, nuclear energy, and national security. When these cross sections cannot be measured directly or predicted reliably, it becomes necessary to develop indirect methods for determining the relevant reaction rates. In an invited paper in the January-March 2012 edition of the journal Reviews of Modern Physics, LLNL scientists Jutta E. Escher, Jason T. Burke, Frank S. Dietrich, **Nicholas D. Scielzo** (former postdoc), Ian J. Thompson, and Walid Younes review the use of the "surrogate nuclear reactions" approach for cross-section determination. This capability is the culmination of a decade of experimental and theoretical effort by many researchers at LLNL to refine and extend this approach and has generated worldwide interest in the technique, as well as strong collaborations between the LLNL researchers and nuclear scientists at many institutions (7 national laboratories and 6 universities in 5 countries). The method is expected to become an important focus of inverse-kinematics experiments at rare-isotope facilities, such as the DOE's $550 million Facility for Rare Isotope Beams (FRIB) at Michigan State University, which will be the new national user facility for nuclear science.
http://link.aps.org/doi/10.1103/RevModPhys.84.353

Notes from the LLPA Council Meeting on Wednesday, May 2, 2012

Start 12:00 PM, B543 Grand Canyon Room. Attendees: Christine Z., Lance S., Andre S., Nick B., Eric W., Charles R., Adam S., Mandoye N., David A.

+ indicates an action item.

1) Summary of postdoc events over the last month and upcoming ones
Vine movie night, happy hour, and postdoc lunch went really well. Kevin Melissare suggested watching the 2012 Euro Cup at the Vine in June. All games are at either 0900 PT or 1145 PT.
+Andre and Lance will schedule a karaoke night.
+Andre will look into soccer game viewing at the Vine

2) T-Shirt Contest:
With total numbers, 105 t-shirts were ordered. $283 has been given to Christine. About $16 collected afterwards, needs to be given to Kris or Christine.
T-shirts are in and they look great. The women's t-shirts have a very nice, soft finish. 8 t-shirts have bad ink stains. These were obtained at a discounted price. Unfortunately, at least two postdocs will be getting stained t-shirts due to limited number of available sizes.
+Andre and Christine will distribute t-shirts on Thursday, May 3 in West Cafeteria (1200-1300).
+Andre and Lance will distribute t-shirts on Friday, May 4 in Central Cafeteria (1200-1300)

3) Lightning talks and tea time:
Charles has set up lightning talks for Friday, May 18 at noon. He has about 5 speakers now.
+Charles will host the talks.

4) Website update:
Abhinav is working on short and long term fixes
+Web team will update us at next meeting
+Web team will put the newsletters online

5) Newsletter:
Time to profile more council members
+David A. will work on exit interviews

6) Brown Bags and Career Development:
New ideas include: technical consulting, continuing education support, scientific writing/editing, policy making, interviewing skills, NIF, adjunct professorships
+Nicholas will help Amy schedule brown bags

7) 4th of July BBQ (All)
Tentative date, Friday, July 13. Location – Del Valle
Funds are available to cover the cost of the meat
Charge a minimal fee to buy drinks, pot luck for the rest
Will need to set up registration
+Lance will contact LLPA members and hopefully assign roles before the next meeting

8) Postdoc Logo: voting on top 3 (All)
We voted on the logos and chose the top three favorites.
+Nathan will follow up with Julie and refine the logo. If he chooses to pursue multiple logos, we will vote again.

9) Poster Symposium
Will likely be held end of May early June. Still working logistics, potentially two locations or we may need to hold the event on two different days (two morning sessions as opposed to a full day). Our funds aren't sufficient to cover lunch for everyone this year.
The PDA may consider planning something social to follow – wine tasting, music, etc…
+Andre and Kirsten will look into planning an event after the symposium
+Kris and Christine may pull a meeting of the PDA together in the next weeks for planning. We will need help with this event.

If you have an issue that you want to bring to the attention of the postdoc community, or you're just interested in being more active here at the Lab, then we'd love to have you come out to our next meeting. Contact Lance Simms (simms8@llnl.gov) for info.

Comments/Suggestions/Praise/Complaints? Your Participation is Welcome!

Please send your comments or questions to the Editor (Nathan Kugland, kugland1@llnl.gov).

Selected Recent Research Publications by LLNL Postdocs

Bold = LLNL Postdoc. *Broadcast your achievements! Make new connections & help show how we are doing collectively.*
Guidelines: 1) Peer-reviewed publications (journal or conference) only, nothing in progress; 2) Your affiliation must be LLNL; 3) Prepare a standard-format citation with all authors (no *et al*), the full title, journal/proceedings info, and a link to the online abstract; 4) Note which authors are LLNL postdocs, and in what division & group; 5) Send all of this to Nathan (kugland1@llnl.gov).

Engineering/Materials Engineering/Precision Engineering Group:
DiBiasio, C.M., **Hopkins, J.B.**, "Sensitivity of Freedom Spaces During Flexure Stage Design via FACT," Precision Engineering, 36(3): pp. 494-499, 2012.

Hopkins, J.B., "Synthesizing Parallel Flexure Concepts that Mimic the Complex Kinematics of Serial Flexures Using Displaced Screw Systems," Proc. of the ASME 2011 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference IDETC/CIE 2011, Washington, DC, USA, August 2011.

Hopkins, J.B., Panas, R.M., "Design of Flexure-based Precision Transmission Mechanisms Using Screw Theory," Proc. of the 11th International Conference of the European Society for Precision Engineering & Nanotechnology, Como, Italy, May 2011.

PLS/AEED: **Hunt, J.D.**, Manning, C.E., "A thermodynamic model for the system SiO2-H2O near the upper critical end point based on quartz solubility experiments at 500-1100 °C and 5-20 kbar," *Geochimica et Cosmochimica Acta*, **86,** 196-213, 2012.

PLS/AEED/Computational Geosciences Group: **Pengcheng Fu**, Scott M. Johnson, Randolph R. Settgast, and Charles R. Carrigan (2012). "Generalized displacement correlation method for estimating stress intensity factors." Engineering Fracture Mechanics, doi: 10.1016/j.engfracmech.2012.04.010.

PLS/AEED/Program for Climate Model Diagnosis and Intercomparison: **Durack, Paul J.**, Susan E. Wijffels and Richard J. Matear Ocean Salinities Reveal Strong Global Water Cycle Intensification During 1950 to 2000. Science, 336 (6080), pp 455-458. 2012. doi: 10.1126/science.1212222

PLS/CMMD: Babak Sadigh, Paul Erhart, **Alexander Stukowski**, Alfredo Caro, Enrique Martinez, and Luis Zepeda-Ruiz, "Scalable parallel Monte Carlo algorithm for atomistic simulations of precipitation in alloys," Physical Review B, 85, 184203 (2012)

PLS/CMMD/QSG (Quantum Simulations Group): **Donghwa Lee**, and Yosuke Kanai, "Biomimetic Carbon Nanotube for Catalytic CO2 Hydrolysis: First-Principles Investigation on the Role of Oxidation State and Metal Substitution in Porphyrin," The Journal of Physical Chemistry Letters 3, 1369–1373 (2012)

PLS/Nanoscale Synthesis & Characterization Laboratory: **Swanee J. Shin**, Sergei O. Kucheyev, Christine A. Orme, Kelly P. Youngblood, Abbas Nikroo, Kari A. Moreno, Bryan Chen, and Alex V. Hamza, "Xenon doping of glow discharge polymer by ion implantation ", J. Appl. Phys. 111, 096101 (2012).

PLS/Physics/Theory and Modeling Group: W. S. Lee, **A. P. Sorini,** M. Yi, Y. D. Chuang, B. Moritz, W. L. Yang, J.-H. Chu, H. H. Kuo, A. G. Cruz Gonzalez, I. R. Fisher, Z. Hussain, T. P. Devereaux, and Z. X. Shen, "Resonant enhancement of charge density wave diffraction in the rare-earth tritellurides," Phys. Rev. B 85, 155142 (2012)

LLNL Postdoc Association Leadership Council and Teams

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